Union Carbide Corporation,
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Oak Ridge, Tennessee 37830

Dosimetry Studies on the Process and Instruments Smoke Exposure Machine.

Detailed studies will be made to establish the deposition of tobacco smoke particulates in mice exposed on the Process and Instruments Smoke Exposure Machine (SEM II). The work will define the dose of smoke received under exposure conditions being considered for inhalation studies with the SEM II. A series of experiments will be performed to measure deposition as a function of smoke concentration, exposure time, and smoke flow rate through the animal containment units. Results of this study will aid in the selection of the best conditions for long-term chronic inhalation studies.

Other studies will address basic questions related to the dose of smoke particulates received by mice in inhalation studies and new methodological approaches to measure smoke uptake by animals. The possible effects of smoke particle size on the total deposition and deposition site in the respiratory tract will be investigated using the SEM II to generate smoke aerosols of abnormally large particle size. The effect of animal acclimatization on smoke deposition will be investigated as part of other long-term exposure experiments. Efforts will be made to correlate smoke deposition with the time-integral of smoke concentration offered animals, the carbon dioxide exhaled by the animals during exposures, and the carboxyhemoglobin level in the blood of animals at sacrifice. If one or more of these parameters are found to correlate well with particulate dosimetry, methodology will be developed for monitoring the parameter in long-term exposures to provide continuous, non-destructive dosimetry during inhalation exposure experiments.

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